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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/777,689	02/07/2001	Ji Hyun Hwang	MRE-08	3330

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EXAMINER	
JONES, JUDSON	
ART UNIT	**PAPER NUMBER**
2834	

DATE MAILED: 03/25/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/777,689	HWANG ET AL.	
	Examiner	Art Unit	
	Judson H. Jones	2834	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 February 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-25,27 and 28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *17-22* is/are allowed.

6)☒ Claim(s) *1,4,5,7-9,11-13,23,24 and 27* is/are rejected.

7)☒ Claim(s) *2,3,6,10,14-16,25 and 28* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *07 February 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Applicant's arguments with respect to claims 4-18, 23-25 and 28 are have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 112

Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The omitted steps are: a connection between the step of measuring one of surrounding temperature, humidity and pressure and the cooling control system. Also there is no connection between the first and second temperature sensors and the first and second temperature signals. Furthermore the digital signals from the A/D converter are not shown as being connected to anything else in the claim. The mover driver is not shown as having inputs and the cooling fan control signal has no apparent connection to the temperature signals or to the mover driver. Also the position sensing means and driver control means for the mover appear to have nothing to do with "as apparatus for controlling cooling of a gantry" as recited in the preamble to the claim.

Claim 5 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The omitted steps are: the connection between the measured environmental temperature, humidity or pressure and the control of the gantry cooling. If the measurement of environmental variable(s) has nothing to do with the cooling control, it does not belong in the claim. Also the last five lines of the claim are concerned with correcting a movement command to the mover. That method step has nothing to do with controlling the cooling of a gantry.

Claim 27 depends on cancelled claim 26.

Claim Rejections - 35 USC § 103

Claims 4, 7, 9, 11-13, 23 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Menard et al. 5,828,501 B1 in view of Japanese reference JP354106969 A, Emoto 6,226,073 B1 (of record) and Crevel 4,494,184 A. (A translation of the Japanese reference will be included in the next office action.) Menard et al. discloses a gantry as described in column 1 lines 35 ½ to 42 ½ with an encoder as described in column 6 lines 2-4 and teaches the problem of varying temperatures distorting the focusing of the lenses in an imaging system in column 10 lines 55-65. The solution proposed by Menard et al. is to compensate for the changes in the temperature of the imaging chamber. Emoto teaches another method of dealing with changes in temperature in an imaging system in column 1 lines 43 ½ to 59 ½, the method of preventing changes in the temperature of the imaging chamber by compensating for heat generated by the drive motor of the imaging system by cooling the drive motor. Emoto does this by two methods, first by feedforward compensation as described in column 5 lines 24 ½ to 30 ½ and secondly by a feedback compensation as described in column 6 lines 21 ½ to 27 ½. Since Emoto and Menard et al. are from the same field of endeavor it would have been obvious at the time the invention was made for one of ordinary skill in the art to have utilized the cooling means of Emoto in an imaging system in order to prevent changes in the temperature of the imaging chamber and thus improve the accuracy of the system. See also Emoto column 9 lines 1-12 where Emoto teaches an air conditioning system to control the temperature inside an imaging chamber in addition to cooling the motor as shown in figure 5a. Menard et al. uses a stepper motor and a lead screw for changing rotary motion into linear motion while the claim recites a

linear motor. Emoto teaches using a linear motor in column 3 lines 46. Since Emoto and Menard et al. are from the same field of endeavor it would have been obvious at the time the invention was made for one of ordinary skill in the art to have utilized a linear motor in place of a rotary stepper motor and lead screw in order to eliminate the distortions caused by backlash in a lead screw. Neither Emoto nor Menard et al. teaches measuring the temperature of the mover and measuring the temperature of the stator. Japanese reference '969 teaches detecting heat generation of a rotor and a stator and also teaches that the heat from the rotor is not necessarily proportional to the heat from the stator. While Japanese reference '969 is directed toward heating problems in a centrifugal motor (i.e., a rotary motor), the problem of heat in motors is shared by linear as well as rotary motors. Since Japanese reference '969 and Menard et al. as modified by Emoto are broadly speaking in the same field of endeavor and since both devices face the same problem of heat caused by the motors, it would have been obvious at the time the invention was made for one of ordinary skill in the art to have utilized sensors for both the rotor and the stator in a linear motor gantry system in order to improve the cooling of the motor. Menard et al. as modified by Emoto and Japanese reference '969 does not provide details of the feedback system used such as computing a difference between the a measured temperature and a pre-set temperature, computing a temperature gain corresponding to the difference and driving a fan or air valve as long as the temperature gain is greater than a pre-set gain value. Emoto does teach that the controller is a computer or microprocessor in column 7 lines 49-55, teaches a pre-set limit in column 1 lines 50 ½ to 55 ½, teaches measuring the actual temperature in column 6 lines 21 ½ to 24 ½ and since the signals are processed in a computational means, they are stored in the computer at least as long as the signals are being processed. Crevel teaches a sampled data

control system and teaches that a simple servo-control system provides a calculated control signal proportional to the difference between the reference value (i.e., applicant's pre-set temperature value) and the real value of the variables (applicant's measured temperatures, one for the rotor and one for the stator) in column 1 lines 37-41. In figure 4 Crevel discloses a more sophisticated system where TER is the difference between the reference temperature TR and the measured temperature TI, that difference being multiplied by a constant K1. The gain is the difference between the input (TR) and the output of the feedback loop, in this case θ, with TG MAX + TG MIN/2 providing the pre-set gain value. The reason for the pre-set gain value is explained in column 4 lines 34-39. Because Crevel is a reference classified in 700/73, data processing generic control systems or specific applications, sampled data system, and cross referenced into 318/636 motor control, sampling system including miscellaneous "sampled data" control systems, Crevel is from the same field of endeavor as Menard et al. as modified by Japanese reference '969 and Emoto. Since Crevel and Menard et al. as modified by Japanese reference '969 and Emoto are from the same field of endeavor it would have been obvious at the time the invention was made for one of ordinary skill in the art to have computed a temperature gain corresponding to the computed temperature difference and to have included a pre-set gain value to be compared to the computed temperature gain in order to improve the performance of the cooling system by eliminating residual oscillations of the regulated temperature with respect to the reference value.

In regard to claim 9, see Emoto column 7 lines 55-58. Emoto refers to "a cooling medium," not "cooling air" as recited in the claim. However the phrase "cooling medium" includes air as well as liquids of various types.

In regard to claim 11, Japanese reference '969 teaches placing temperature sensors on different portions of motors.

In regard to claims 12 and 13, the cooling system of Emoto as shown in figure 3 cools both the stator and the mover of the linear motor. The cooling of the mover is by indirect cooling resulting from the close proximity of the stator and mover.

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Menard et al. as modified by Japanese reference '696, Emoto and Crevel as applied to claim 7 above, and further in view of Ludwig et al. 5,449,961 A (of record). Menard et al. as modified by Japanese reference '696, Emoto and Crevel discloses a cooling system for a gantry but does not disclose using a fan as a cooling device. Emoto shows a cooling medium in a channel controlled by a valve. Ludwig et al. teaches using a fan instead of a valve in column 1 lines 24-26. Since Ludwig et al. and Menard et al. as modified by Japanese reference '696, Emoto and Crevel are from the same field of endeavor it would have been obvious at the time the invention was made for one of ordinary skill in the art to have utilized a fan in a cooling system in order to reduce the cost of the device by eliminating the channels and the fluid flowing in the channels.

Allowable Subject Matter

Claims 17-22 are allowed.

Claims 25 and 28 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 1 and 5 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action.

Claims 2, 3, 6, 10, 14-16 and 27 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: The prior art of record does not disclose or teach a method for operating a gantry where the difference between an expected temperature value and a pre-set value is used to correct a movement command for the mover of a linear motor and is also used for controlling a cooling device in combination with the other features of claims 1, 5, 14, 17 and 28. While claim 15 was previously rejected by using Leuthen 4,542,324 A, combining that teaching with Menard et al. as modified by Japanese reference '969 and Emoto would not have been obvious. Emoto teaches an elaborate system using feedforward compensation, feed back compensation and air conditioning to control the temperature of the air inside an exposure chamber. There is no obvious reason why Emoto would make the speed of a linear motor correspond to a temperature difference between a measured value and a pre-set value because Emoto has disclosed an alternative solution to the problem of the heating of a motor. The prior art of record does not disclose or teach first and second cooling systems with first and second control signals for cooling a linear motor as recited in claim 10. While duplicating parts for a multiplied effect is not viewed as a patentable advance, there would be no reason for using a second control signal to control a second control means in a system where the cooling means was being duplicated. Applicant is using first and second cooling devices controlled by first and second cooling control means to cool different parts of the motor. Japanese reference '696 teaches temperature sensors on both the stator and moving part of a motor but does not teach even one cooling means. When an excess temperature is noted in

the Japanese reference '696 device, power is cut to the motor. The prior art of record does not disclose or teach measuring an environmental variable as the basis for activating a cooling device configured to cool a linear motor in combination with measuring a temperature of a stator and a temperature of a mover of the linear motor in combination with the other features of claim 25. Emoto teaches an air conditioning system in column 9 lines 1-12. That system would need some sort of sensor for sensing an environmental parameter to operate but that system has no disclosed connection to the cooling device for cooling the linear motor. The prior art of record does not disclose or teach a first cooling device to cool the stator of a linear motor combined with a second cooling device to cool the mover of a linear motor in combination with the other features of claim 27.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Judson H. Jones whose telephone number is 571-272-2025. The examiner can normally be reached on 8-4:30 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Darren Schuberg can be reached on 571-272-2044. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JHJ 3/15/2004

THANH LAM
PRIMARY EXAMINER